# THE GENERALIST'S CORNER

## Teaching Evolutionary Psychology: An Interview With David M. Buss

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Barker: What are the basic tenets of evolutionary psychology?

Buss: At the most general level, evolutionary psychology is simply an approach to the study of psychology that is informed by modern principles of evolutionary biology. As such, it is a lens through which to view psychology, an approach to exploring the mechanisms of the mind. Evolutionary psychology is not a branch of psychology, such as perception or social psychology. It's a lens through which any psychological phenomenon can be examined.

Although there is some theoretical diversity among evolutionary psychologists, some of the basic tenets of evolutionary psychology include:

- *All manifest behavior is a function of psychological mechanisms* in conjunction with inputs to those mechanisms (some inputs come from the external environment; some come within the organism, including physiological activity and information from other psychological mechanisms).
- *All psychological mechanisms at some basic level originate from, and owe their existence to, evolutionary processes.* Scientifically, no other known causal processes exist for creating complex organic mechanisms.
- *Darwin's theories of natural and sexual selection are the most important evolutionary processes responsible for creating evolved psychological mechanisms.* Other evolutionary forces, such as genetic drift, are generally too weak to fashion adaptations.
- *Evolved psychological mechanisms can be described as information processing devices*. They are designed to take in input, transform that input through a

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series of procedures, and produce output at various points throughout an organism's life span.
- *The output of evolved psychological mechanisms* can be physiological activity, information that serves as input to other psychological mechanisms or manifest behavior.
- *Evolved psychological mechanisms are instantiated in the brain*, in neural structures.
- *Evolved psychological mechanisms are functional*: They function to solve statistically recurrent adaptive problems that confronted our ancestors over deep time.

Barker: By "deep time" are you referring to hundreds of thousands of years of evolution?

Buss: Absolutely. Each psychological mechanism has its own environment of evolutionary adaptedness, or EEA. The EEA does not refer to a specific time or a place, as some mistakenly believe. Rather, the EEA refers to the statistical composite of selection pressures responsible for creating and maintaining a particular psychological mechanism. The eye has a different EEA than does bipedalism or male sexual jealousy—each has originated through its unique set of selection pressures, responding to different adaptive problems, and evolved over different time depths.

Barker: What do evolutionary psychologists mean when they speak of "functionally specific psychological mechanisms"? Are they referring to modularity?

Buss: Yes. The mind contains many functionally specific psychological mechanisms just as the body contains many functionally specific anatomical and physiological mechanisms (e.g., a heart, lungs, liver, kidneys, larynx, rods, cones, bones). However, I generally do not use the term *modularity* because it means different things to different scientists. For example, some view modularity as implying information encapsulation, the notion that adaptations are entirely walled off from other adaptations. Functional specificity, however, does not imply information encapsulation; psychological mechanisms often share information. The heart is a functionally specialized adaptation, but it interacts with other bodily organs such as the liver and lungs. Similarly, functionally specialized psychological mechanisms interact, share information, may share components, and get activated, orchestrated, and concatenated in various sequences. Adaptations for sexual jealousy, for example, interact with adaptations for self-assessment of mate value. The lower mate value partner in a relationship, for instance, generally experiences higher levels of jealousy.

Barker: Are there any other tenets of evolutionary psychology that you would like to mention?

Buss: There are three other important tenets that I think psychology teachers should share with their students:

- *Human psychology consists of the large number of evolved psychological mechanisms* including the inputs that trigger their activation, the procedures, inferences, and decision rules that transform the input and their functional output.
- *Good hypotheses about evolved psychological adaptations should explain known facts and generate precise predictions* about design features yet unknown.
- *The conceptual toolbox of evolutionary psychology has led to the discovery of many psychological phenomena that had remained entirely unknown to mainstream psychologists prior to the work of evolutionary psychologists.*

Adaptations to ovulation provide good examples of this last conclusion (see, e.g., Gangestad, Thornhill, & Garver-Apgar, 2005). Given that ovulation is a small and critical window during which a woman is temporarily capable of conception, evolutionary psychologists have hypothesized male and female adaptations to ovulation. Females who are currently partnered with lower mate-value males, for example, experience more sexual fantasies about extrapair partners. Males display more intense mate guarding of their partners near ovulation. No prior theory within mainstream psychology predicted the discovery of these important psychological and behavioral phenomena.

Barker: Do you have any recommendations for how teachers of introductory psychology should introduce their students to these tenets? Should they weave them throughout their coverage of psychology's subdisciplines or should they be taught all at once in a separate section of the course, perhaps when genetics or neuroscience are being covered?

Buss: I recommend a combination of these approaches. In my courses, I introduce the basic tenets early on, but then continue to weave them throughout discussion of the content areas. It's important to keep in mind that evolutionary psychology provides a perspective through which any psychological or behavioral phenomena can be examined. It's always worthwhile to pose the question: "What is the function of X?"

In the future, I believe that the conceptual toolkit provided by evolutionary psychology will be applied to all psychological phenomena. This statement does not imply that it will be equally illuminating in all domains of psychology or magically solve all of the field's problems. Rather, evolutionary psychology provides a guide to domains previously unexplored, prompts us to pose important novel questions within those domains, and provides an additional layer of explanation.

Barker: What kinds of teaching tools might be found in this conceptual toolkit?

Buss: One tool I use in introducing the tenets of evolutionary psychology is to draw analogies to the human body. Students can see that an understanding of the liver, heart, or larynx would be incomplete unless we correctly understood their functions. Similarly, our understanding of mate selection, cooperation, and aggression would be incomplete unless we correctly understood the functions of the underlying psychological mechanisms that give rise to these important human behaviors.

Another tool I find effective in teaching is to bring in lots of animal examples. As members of the species we are studying, it's sometimes difficult to view ourselves

objectively. It's easier to see phenomena in other species. There's one hilarious Gary Larsen cartoon I use. A man is in his backyard explaining to his son that the sparrows in the trees are staking out their territories, which he describes as an instinct common in the "lower" animals. The man is oblivious to the fact that he is surrounded by fences demarcating his own property, living in a neighborhood full of fenced properties. It's easier to see territorial adaptations in other species than it is to see them in ourselves.

Using concrete animal examples helps students to see the importance of adaptations and of posing questions about function, which makes it easier for students to understand human *psychological* adaptations. I don't mean that humans are like this or that other animal species. Each species has its own adaptations, some of which are unique. Spiders, dogs, and humans all locomote, but each species does it in a different way. Animal examples, however, help students to decenter a bit and see our own species through a more objective scientific lens.

Barker: Given that humans evolved, what are the three most critical implications of evolution for understanding psychology?

Buss: Evolution by selection is the only known causal process powerful enough to create complex, functional, organic mechanisms. This statement applies to the human mind no less than the human body.

One critical implication is that *evolutionary theory provides a metatheory for psychological science.* As a powerful metatheory, it provides these valuable advantages: It is comprehensive, internally consistent, parsimonious, organizes and explains known facts, and guides investigators to new and important phenomena and domains of discovery. If an alternative metatheory exists for psychological science, it has not been revealed to the scientific community.

A second critical implication is that *evolutionary psychology unites disparate topics, psychological phenomena, and psychological subdisciplines*—cognitive, social, learning, personality, clinical, developmental, neuroscience—within a single coherent framework. Consider the current organization of most introductory psychology textbooks. Most proceed from chapter to chapter, with little or no linkage among the chapters. It is as though cognitive psychology, for example, is entirely walled off from social psychology. Evolutionary psychology reveals why all these different topics actually do belong within the covers of an introductory textbook. Evolutionary psychology reveals the current subdisciplinary boundaries to be at least somewhat arbitrary.

Barker: Can you provide an example?

Buss: Certainly. Consider "stranger anxiety" as a candidate psychological adaptation. Its function is to motivate the infant to recoil from potentially dangerous humans and to maintain close proximity to caregivers, thereby avoiding hazards that strangers might pose. Stranger anxiety possesses a number of well-articulated design features. It shows universality, emerging in infants in all cultures in which it has been studied. It emerges predictably during ontogeny at roughly 6 months of age, coinciding with the time when infants begin crawling away from their caregivers and potentially encountering strangers. Its focus centers on strange males rather than strange females because strange males historically have been more hazardous to infants' health. Stranger anxiety shows all the characteristics of "improbable design" for achieving a specific function.

Barker: In which subdiscipline of psychology does stranger anxiety belong?

Buss: Well, stranger anxiety obviously involves information processing and so could be claimed by cognitive psychology. It shows a predictable ontogenetic unfolding, so could be claimed by developmental psychology. It is activated by interactions with others, so it clearly belongs to social psychology. Individual infants differ in the intensity of stranger anxiety, so it falls within the province of personality psychology. The mechanism can malfunction in a minority of infants, so it's relevant to clinical psychology. Its biological substrate must include the brain, so neuroscience can also lay claim. Obviously, stranger anxiety belongs simultaneously to all or to none of these subdisciplines.

Evolutionary psychology breaks down these traditional disciplinary boundaries. Viewed through the theoretical lens of adaptive problems and their evolved psychological solutions, evolutionary psychology offers a nonarbitrary means for carving the mind at its natural joints. It provides the conceptual unification of the disparate branches of psychology that currently operate in virtual isolation. It also integrates psychology theoretically with the rest of the natural sciences in a unified causal framework. These are powerful scientific benefits!

Barker: Any advice for how best to convey these benefits to students?

Buss: Again, one effective teaching technique is to draw analogies to the human body. What is a nonarbitrary way to view the "natural joints" of the body? We consider sweat glands, taste buds, and opposable thumbs to be distinct body mechanisms because they each have different functions. Similarly, we view mate preferences, stranger anxiety, and landscape preferences to be distinct psychological mechanisms because they have distinct functions. Economic behavior (e.g., how people exchange objects of worth) and political behavior (e.g., how people form coalitions and use them to ascend status hierarchies), to take two other examples, emanate from evolved psychological mechanisms. Thus, evolutionary psychology links the field of psychology with the fields of economics and political science. Students usually have an "a-ha" experience when they see these connections.

Barker: And the third critical implication of evolution for understanding psychology?

Buss: Very good. The third critical implication is that *understanding psychology requires understanding the functions of our psychological mechanisms*—the tasks that they were designed by selection to accomplish. Just as a medical researcher's understanding of the heart, the lungs, or the liver would be woefully inadequate without describ-

ing their proper functions (i.e., to pump blood, to uptake oxygen, to filter toxins), we cannot have a complete understanding of our psychological mechanisms without knowing their proper evolved functions. Understanding function is not an optional exercise; it is essential for a deep understanding of the human mind and all of its component mechanisms.

Barker: I've taught some form of evolutionary psychology for over 30 years in "red state" universities and not surprisingly have found many students who have conditioned emotional responses to the word *evolution* that interfere or otherwise preclude effective teaching of evolutionary psychology. What do you recommend to those who teach introductory psychology about how to deal with the culture clash?

Buss: Resistance to evolutionary psychology comes from several sources. One is that it is erroneously believed to be a doctrine of "genetic determinism," with the implication that "if it's evolved, then the environment is irrelevant, and therefore we cannot change it." This sort of thinking represents a serious misunderstanding of evolutionary psychology. The environment, which of course includes culture, plays a critical causal role in manifest behavior at every level in the chain of causality, from the origins of adaptations through their expression in human behavior. The environment defines the adaptive problems that form the forces of selection responsible for creating evolved psychological mechanisms. The ontogenetic environment is crucial to the development of all evolved psychological mechanisms, which, as it turns out, are highly responsive to the environment. So it is simply a mistake to think of evolutionary psychology as a form of "genetic determinism." It's not.

Barker: What would be a specific example of the role environment plays in the development of evolved psychological mechanisms that teachers could use in the classroom?

Buss: One example that I use centers on the effect of father presence versus father absence on the development of mating strategies. There is some evidence that girls and boys growing up without an investing father are more likely to select a short-term mating strategy from the human menu of strategies, whereas those children growing up with an investing father are more likely to pursue a long-term mating strategy. There are competing theories for this correlation, of course, but the example shows how experiences during development can influence the operation of evolved psychological mechanisms.

Another example centers on the effect of experiencing infidelity in a romantic relationship on subsequent jealousy thresholds. Those individuals who have experienced a partner being unfaithful appear to lower their thresholds for experiencing jealousy in subsequent relationships. Thus, experience can calibrate thresholds on psychological mechanisms.

Barker: We sometimes see the idea of genetic determinism spilling over into social and political issues. Does this issue represent anything we should be concerned about in our teaching of evolutionary psychology?

Buss: Yes, I think it does. As a result of this misunderstanding, some people, including students, believe that evolutionary psychology is antithetical to their political ideologies. Some people want to change the world and to solve social problems such as discrimination and injustice, and these ideals are perfectly legitimate social goals. It is a mistake, however, to believe that evolutionary psychology is a doctrine that either renders change impossible or somehow endorses the status quo. Evolutionary psychology is a descriptive science. As such, it does not endorse the status quo or any particular ideology.

I think it is also worth noting that evolutionary psychology is an equal opportunity offender—it has tenets that offend people of all sorts across the political spectrum. Those people on the left sometimes perceive it to be antithetical to their goals for social change. Some people on the right are offended because they perceive that evolutionary theory is antithetical to deeply held creationist religious beliefs. However, evolutionary psychologists vary widely in their politics and are represented across the spectrum.

Barker: So, how might psychology teachers counter these sorts of misunderstandings?

Buss: In my experience, it helps greatly to devote a reasonable amount of time to explaining the logic of the enterprise, working through a number of concrete examples, and then dealing with the misunderstandings head on. It's sometimes tough because students usually have no prior exposure to the principles of evolutionary biology and so come into class with many misconceptions (unfortunately, some of the misconceptions come from other psychology classes they've taken in which their professors were confused about the issues).

Barker: Can you provide an example or two that accurately serve as good starting points to clear away these kinds of misunderstandings?

Buss: Sure, I find the callus-producing example a useful place to start. To produce a callus, one needs (a) an evolved callus-producing adaptation, (b) environmental input (repeated friction to the skin) that activates it, and (c) physiological procedures that (d) produce new skin cells in the precise locations of the repeated friction. Clearly, the adaptation is designed to deal with special environmental hazards and requires environmental input for its activation. We also can create friction-free environments that prevent activation.

The same logic applies to evolved psychological mechanisms. Consider jealousy as a candidate adaptation. A person does not just wake up in the morning and become jealous. The mechanism is activated by particular circumstances, such as a partner giving off cues to infidelity or a rival making sexual advances toward one's partner. Just as one can design friction-free environments, in principle one can design environments that prevent the activation of jealousy. Working through concrete examples like this one helps students to see that evolutionary psychology is a truly "interactionist" framework and the only powerful interactionist framework that I'm aware of for understanding psychological mechanisms.

Barker: Some psychologists challenge the legitimacy of evolutionary psychology. How do you respond to charges

that there aren't sufficient data to make evolutionary claims about complex human behavior?

Buss: There are many reasons why some people find evolutionary psychology threatening. I believe that evolutionary psychology is a true scientific revolution, probably the most important scientific revolution we've ever had in the history of psychology. As such, it is sometimes threatening to those who have made their names, reputations, and prestige through the nonevolutionary standard social science model. I have deep admiration for those scientists who, despite having made reputations within the mainstream paradigm, have been able to recognize the importance of evolutionary psychology and adopt it in their work. Of course, young minds, less mired in historical paradigms, are generally more open to evolutionary psychology.

Barker: How has evolutionary psychology been challenged by individuals who are threatened by it?

Buss: Evolutionary psychology is challenged all the time. Many of the challenges come from individuals who are frankly ignorant of the logic of evolutionary psychology and the massive amount of empirical evidence that currently supports specific evolutionary hypotheses. Many of the attacks on evolutionary psychology badly mischaracterize it, for example by assuming that it's a form of genetic determinism (it's not), sexist (it's not), or politically conservative (it's not). The challenges are "motivated," in the sense that people start out disliking evolutionary psychology and then look for ways to tear it down. Nonetheless, I've been greatly heartened by the increasing acceptance of evolutionary psychology within the field. It's now covered in all introductory psychology textbooks, albeit with varying degrees of accuracy.

The plain truth is that, in some domains, the empirical data overwhelmingly support specific evolutionary hypotheses. Evolutionary psychological hypotheses, of course, have to be evaluated on a case-by-case basis. Some hypotheses will turn out to be incorrect, like hypotheses in any scientific endeavor, but some hypotheses will turn out to be correct. Others will be partly correct and will require modification as the interplay between theory and empirical data gets carried out.

Barker: What are the best examples of empirically supported evolutionary psychological hypotheses?

Buss: Good question. Here's a short list of some of excellent examples of hypotheses that have received robust empirical support:

- Greater male than female desire for casual sex with a variety of partners (Schmitt, in press).
- Female mate preferences for mates with resources (Buss, 2003).
- Male preferences for mates who are young and physically attractive (Buss, 1989; Kenrick & Keefe, 1992).
- Universal standards of female attractiveness linked with cues to fertility (cues to youth, cues to health, low waist-to-hip ratio, etc.; Sugiyama, 2005).
- Female superiority in spatial location memory (Silverman & Choi, 2005).
- Stranger anxiety adaptation that emerges universally and predictably during development (around 6 months) and whose focus is mainly on strange males (Heerwagen & Orians, 2002).
- Sex differences in the design features of jealousy (Buss & Haselton, 2005).
- Cheater detection adaptations in social exchange (Cosmides & Tooby, 2005).
- Incest avoidance mechanisms (Lieberman, Tooby, & Cosmides, 2003).
- Love as an adaptation for long-term mating (Fisher, 2004).

Among the hypotheses and ideas that are extremely promising and have received some empirical support are

- Female and male adaptations to ovulation (Gangestad et al., 2005).
- Negative sentiments to punish cheaters who violate social contracts (Price, Cosmides, & Tooby, 2002).
- Predator avoidance mechanisms (Barrett, 2005).
- Adaptations in males for allocating less parental investment to children when their paternity is uncertain (Daly & Wilson, 1998).
- Cognitive biases in cross-sex "mind-reading" designed to make more frequent, but less costly, inferential errors (Haselton & Buss, 2000).
- Adaptations for committing infanticide under certain conditions (Daly & Wilson, 1998).
- Adaptations for coalitional warfare (Buss, 2005b).
- Evolved antihomicide defenses (Duntley, 2005).
- Adaptations for allocating life-or-death resources as a function of degree of genetic relatedness (Burnstein, 2005).

Keep in mind, though, that there have been several evolutionary psychological hypotheses that have been shown to be empirically false. One example is the kin-selection hypothesis of the origins of male homosexuality. According to this hypothesis, male homosexuality evolved as a strategy to shunt some individuals away from direct reproduction toward a strategy of allocating resources toward genetic relatives. This hypothesis, initially proposed in 1978, has now been soundly refuted (Bobrow & Bailey, 2001).

Barker: Nonetheless, the empirical basis for evolutionary psychology is very solid.

Buss: Absolutely, but of course, there remain many specific evolutionary hypotheses that have not yet been tested adequately. One example concerns the possible function of female orgasm. Some theorists have proposed that female orgasm is a mate selection device for choosing Mr. Right. Others have proposed that female orgasm functions to facilitate successful conception by drawing the sperm into the female reproductive tract. Still others have proposed that female orgasm serves no function and is instead a functionless by-product, like

male nipples, which is a result of males and females sharing a common embryological design. All three are perfectly legitimate competing evolutionary hypotheses, but decisive empirical tests have not yet been conducted to adjudicate among them.

This point leads us to a critical issue. Theories and hypotheses within evolutionary psychology have led investigators to discover new psychological phenomena that mainstream psychologists missed entirely prior to the advent of evolutionary psychology. When scientists discover new phenomena (e.g., sex differences in jealousy or psychological shifts around female ovulation), it is perfectly legitimate for other scientists to offer competing hypotheses to explain those findings. That's simply good science.

However, it has been remarkable to me the astonishingly low threshold some people have for accepting the "alternative" hypotheses. These alternatives are often advanced post hoc, after the findings have been discovered by evolutionary psychologists. Often these competing hypotheses fail to offer new empirical predictions that could potentially falsify them. Part of the problem is that many of these competing hypotheses are so vague that they are not testable—culture, learning, and rationality ("people just figure it out") are three examples.

Barker: Can you provide an example of any cases in which such alternative hypotheses have led to rigorous empirical research?

Buss: Yes, but keep in mind that the few instances in which these alternatives *have* been sufficiently precise to generate legitimate testable predictions, they have not generally fared well. Consider again jealousy. After evolutionary psychologists hypothesized and then subsequently discovered sex differences in jealousy—findings totally missed by prior researchers despite hundreds of empirical studies on jealousy—two psychologists (DeSteno & Salovey, 1996) proposed an alternative hypothesis called the "double-shot" hypothesis, which they believed could better explain the existing sex differences. I was delighted by their competing hypothesis because it actually could be tested empirically. Their ideas led to a raft of new empirical studies, and the results are now clear. The double-shot hypothesis of jealousy has been decisively refuted in empirical tests (see Buss & Haselton, 2005; Buss et al., 1999), so that even its original authors appear to have abandoned it.

Barker: Are such points as this one, which highlight the process of science, legitimate for inclusion in the introductory course—and is evolutionary psychology a reasonable topic to introduce students to the self-correcting nature of good science?

Buss: Yes, absolutely. Perhaps because of its somewhat controversial nature, evolutionary psychologists have been forced to state their hypotheses with greater conceptual clarity and precision. And more than most perspectives in psychology, evolutionary psychologists have been required to conduct rigorous empirical tests to deal with competing nonevolutionary hypotheses. The cumulative and self-correcting nature of evolutionary psychology is precisely what should be taught in introductory psychology classes.

At a broader level, I'm actually writing an introductory psychology text myself, using evolutionary psychology as an overarching framework. At the current time, most introductory texts jump from topic to topic—learning, memory, intelligence, personality, language, social interaction—with little or no connections among them. Introductory psychology is taught like a buffet, cafeteria style, with little integration among the different dishes. In my text, I'm trying to show that the seemingly disparate domains of psychology in fact are connected. Evolutionary psychology provides the metatheoretical strands that link the different disciplines.

In my teaching, the reactions of students have been tremendous. I'll give one example. A variety of different studies have shown that male and female jealousy adaptations are somewhat differently designed. Not only do men and women differ in their emotional responses to sexual and emotional infidelity, they also show differences in memory for cues to sexual versus emotional infidelity and for speed of processing emotional versus sexual infidelity cues. These findings illustrate for students important connections between *emotion* (in this case the emotion of jealousy) and *cognition* (memory and speed of processing). Typically, the topics of memory and emotion are taught in separate chapters in introductory texts, with few or no connections made. Evolutionary work showing their connections makes these topics spring to life for students, and they really remember them!

Barker: What sorts of methodological issues arise when scientists compare the utility of evolutionary and nonevolutionary theories for explaining behavior?

Buss: What's been astonishing to me is the double standard that's typically applied to evolutionary versus nonevolutionary hypotheses. For evolutionary hypotheses, one typically has to conduct numerous studies using multiple methods that obtain decisive findings before they are accepted to the top journals. In contrast, too often, the flimsiest papers with flawed logic and absurdly weak empirical data that oppose an evolutionary hypothesis get accepted and published. Papers that invoke "culture" or "socialization" as causal explanations are routinely accepted, even though these concepts are typically rendered in such a vague manner that they lack explanatory power and are unfalsifiable.

Barker: Can you explain why journal editors and consulting editors would accept such flawed work to appear in their journals?

Buss: My point doesn't apply to all journal editors or consulting editors, of course, and many have been receptive and impartial to papers submitted from an evolutionary perspective. But some editors have an antievolution bias or simply have been trained in the standard social science model prior to the advent of evolutionary psychology. As a result, some editors and reviewers don't really understand the logic of the enterprise and are occasionally motivated to overlook flaws and publish articles that purport to refute evolutionary psychological hypotheses. Some editors do not send the manuscripts to reviewers who are actually well-enough trained in the logic of evolutionary theory to make an informed evaluation.

Barker: Has this been your experience?

Buss: With a few exceptions, I can't really complain. My own work has been published in the top journals in the field, such as *Psychological Review, Psychological Bulletin, Psychological Science, Journal of Personality and Social Psychology.* I'm optimistic about the long-run success of evolutionary psychology. It has led to so many new discoveries that there is no turning back. As Steven Pinker (2002) noted, evolutionary psychology has provided the only compelling theories we have in entire domains of functioning, such as mating, parenting, parent–offspring conflict, kinship, cooperation, aggression, morality, and emotions. The field of human mating, to take one example, was virtually nonexistent before the work of evolutionary psychologists. Because evolutionary psychology is truly cumulative in its scientific advances, it will gradually achieve a greater and greater importance in the field. We've already witnessed progress within the past 5 years, and it's been greatly heartening to me.

Barker: Clearly evolutionary psychology has attracted a large number of harsh critics, perhaps more so than other areas of psychology. How has their voice impacted the nature and direction of research in evolutionary psychology?

Buss: The fact that evolutionary psychology has attracted so many harsh critics is a testament to its growing prominence and prestige in the field. Some psychologists have made entire careers from trying to demolish a particular evolutionary hypothesis. Harris (2000), for example, has attained a considerable reputation by publishing numerous articles purporting to falsify one evolutionary hypothesis about jealousy. Despite many attempts, however, that evolutionary hypothesis continues to be supported by voluminous empirical evidence (see Buss & Haselton, 2005; Sagarin, 2005). The critics, however, largely have had a salutary effect on the field. Evolutionary psychologists have been forced, in a way that most nonevolutionary psychologists have not been, to be more rigorous and precise in their thinking and more robust in their science. That's been good for the field because it advances the science of the mind more rapidly and cumulatively.

Barker: What's the take-home message for teachers who want to incorporate evolutionary psychology into their teaching?

Buss: There are several take-home messages. Teachers will find that students are fascinated by evolutionary psychology. Teachers should present the logic of the broader theories, such as natural selection, sexual selection, and inclusive fitness. Then they should show how specific testable hypotheses have been developed in particular domains, such as mating, aggression, and cooperation. Next, they should present competing hypotheses where they have been advanced. Finally, they should show students the empirical tests that have been used to adjudicate among competing hypotheses. I would include examples in which evolutionary hypotheses have been falsified (e.g., the kinship theory of homosexuality) as well as examples of evolutionary hypotheses that have been robustly confirmed using multiple methods (e.g., evolved sex differences in jealousy). Evolutionary psychology shows the field of psychology to be vibrant, cumulative, self-correcting, and perhaps most important, intrinsically fascinating.

Barker: Should female psychology professors be threatened by the tenets of evolutionary psychology?

Buss: Absolutely not. There are several dimensions to this issue. First, many of the founders and prominent practitioners of evolutionary psychology are female psychology professors. Examples include Leda Cosmides, Margo Wilson, Martie Haselton, Barbara Smuts, Sarah Hrdy, Helen Fisher, Debra Lieberman, Anne Campbell, Denise Cummins, and Catherine Salmon (see Buss, 2005a).

Second, consider what we know about sex differences as revealed by research in evolutionary psychology. From an evolutionary perspective, neither women nor men can be considered superior or inferior to the other, any more than a bird's wings can be considered superior or inferior to a fish's fins. Each sex possesses adaptations designed to deal with their own adaptive problems. Some adaptive problems have been similar for men and women. Some have been different. Notions of superiority or inferiority are incoherent from the vantage point of evolutionary psychology.

A third issue is that some of the findings of sex differences are truly upsetting to people. In my experience, some women are genuinely bothered by the fact that in their selection of mates, men place a higher premium on physical appearance than do women. Some men are genuinely bothered by the fact that women place a higher premium on resource acquisition than do men. And both sexes, but perhaps women more than men, sometimes find men's desire for a variety of sex partners to be disturbing. I myself have been deeply disturbed by some of my findings, such as men's evolved psychology of murder (Buss, 2005b).

It's critical, however, that we separate the issue of whether these sex differences exist from our visions of what we want to exist. The fact is that there are dark and distressing aspects of human nature. As scientists, we cannot turn away from these issues, or blinker ourselves to their existence, just because we find them disturbing.

Barker: Do you have any recommendations as to how teachers might best introduce their students to such disturbing findings—or should teachers even bother to do so?

Buss: I sometimes give students what I call my "surgeon general's warning." I tell them straight out that there is considerable evidence that there are dark and disturbing components of human nature—things like sexual treachery, outgroup prejudice, violence, and murder. I also tell them up front that there is considerable evidence that women and men differ in their underlying psychology in certain domains, particularly in the domains of mating and aggression.

I then provide the key evolutionary metatheory of sex differences: Men and women are predicted to differ *only* in those domains where the sexes have recurrently faced different adaptive problems over human evolutionary history. In all other domains, where the sexes have faced similar adaptive problems, men and women

are predicted to be similar psychologically. This metatheory helps students to understand that it's not that "men are from Mars, women from Venus," but rather that each sex has adaptations that are well-suited to the adaptive problems their sex has historically confronted.

Finally, I present the empirical evidence. I find that framing diffuses a lot of tension around controversial topics and makes students more open to the science. Indeed, the responsiveness of students to evolutionary psychology has been tremendously gratifying. Many end up wondering why it's not taught in *all* of their psychology classes.

Barker: Do you have any final recommendations to teachers of introductory psychology regarding how to go about teaching evolutionary psychology in their courses?

Buss: One of the things students respond to is a teacher's genuine excitement about psychology. I tell my students that we live in an exciting time in the history of the science of psychology. We are blessed to be living at a time when a genuine scientific revolution is taking place—what I believe is the most important scientific revolution in our beloved field's history. New discoveries are being made at a tremendous pace as psychologists use the conceptual tools provided by evolutionary psychology to discover previously uncharted domains of the human mind. I find that the enthusiasm and excitement are infectious, and students really get engaged. It makes them feel like they are part of something very special—and indeed, they are. We all are.

Barker: Thank you very much for sharing your thoughts on the teaching of evolutionary psychology.

Buss: Thank you! It's been a tremendous delight to have this interchange.

## Resources


Barrett, H. C. (2005). Adaptations to predators and prey. In D. M. Buss (Ed.), *The handbook of evolutionary psychology* (pp. 200–223). New York: Wiley.

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